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ESIP Energy and Climate WG:
Dynamic Decision Tools Catalog and Community of Practice

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Energy and Climate Working Group

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ESIP Winter 2012 Workshop: Outcome

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- Understanding of agencies, project proponents and NGO concerns and current state of the tools used for assessments
  - Risks and Environmental Impacts associated with Energy Related Projects
  - State of transparency in terms of models used and data behind them in existing assessment tools
- Identification and characterization of needs
  - Gap analysis
  - Requirements for a Dynamic decision tools catalog and community of practice
- Proposed framework for ESIP role
  - Engage Academics, Industry, Fed agencies, and NGOs
  - Cross sector understanding of needs
  - Facilitate a community dialog and discussion
  - Maintain decision tools catalog
  - Facilitate partnerships in further tool development

Renewable Energy Projects Site Selection (Solar, Wind, Geothermal)

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- Stakeholders
  - Federal agencies and Project proponents
  - Research scientists
  - Infrastructure planners and developers
  - NGOS/Others concerned with environmental and ecological impacts
- Current Concerns
  - Solar energy installations can threaten wildlife and detract from nearby historic buildings
  - Wind turbines can pose threats to wildlife and air traffic, interfere with radar operation near military installations

Need frameworks and methods to assess risks associated with these projects.

Key Stakeholder Needs

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- Stakeholder Engagement
  - User centered design process engaging stakeholders throughout the cycle
  - comprehensive and sustainable frameworks and methods for access to actionable information
- Decision Support Tools Transparency and Quality Control
  - Lack transparency to varying degree about models used and the underlying data
  - Many lack clear documentation and no standardized quality control or comparison of models
- Data Access and Exploitation
  - Access to relevant data from disparate data sources with ability to download or transform data
    - OpenEI applications offer data; don't allow users to "play" with it
  - Consistent framework for data access and use
    - DOE apps for solar, geothermal, and wind power siting (power generated, federal/state rebates and incentives)
  - Greater institutional commitment from data owners to maintain state of the art platforms and services

Key Stakeholder Needs (Cont'd)

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- Interoperability
  - Approach not coordinated among agencies and organizations
  - Cross-referencing and interoperability are major issues
- Open Source
  - Many software/tools developed within the government are not open source
    - free redistribution, distribution in source code and compiled format, allows modifications and derived works, technology neutral
  - May be beneficial to publish the application development work to facilitate wider usage.
- Mobile and Social Networking Platforms
  - Access to decision support tools via mobile devices/location awareness
  - A solution in a highly distributable format, e.g., Facebook

Enabling Technologies: Semantic Web

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- To assess potential environmental and human impacts requires discovery and effective use of interdisciplinary data, information, and tools
- Can use "semantic aggregators" for gathering information from several different sources
- Enables content "curation", where in addition to gathering information, the aggregator tool organizes, categorizes and ranks content by relevance
- Semantics web development requires domain expertise, use cases, and a methodology to proceed with knowledge extraction

Enabling Technologies: Drupal

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- Open source Web Content Management Framework used to create basic websites to a full feature portal to support an online community
- Widely utilized to create portals within the scientific community to catalog and share science artifacts
- extensive administration and user interface, custom content types, versioning, taxonomy support, search support, a template and theme system
- has been used for document/data/metadata management, and is well suited for community based frameworks. Examples: NASA JPL DAAC, and DOE Bioenergy KDF)

Dynamic Decision Tools Catalog

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- A matrix of decision tool functions and features
- Listing of base data layers, their source, and follow on adjustments to the data layer that are component to the decision tool
- Tracking of updates to decision tools
- Keeping a tally of applications of each decision tool
- Contact information for decision tools
- User requirements
- Metadata about the decision tools
- Use cases
- Collaborative environment
- Mapping tools to user applications
- Connecting tools to datasets
- How to better utilize and maximize the value of this tool
- Gap analysis

ESIP Community of Practice

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- Fed Agencies, NGOs, Users
  - Provide requirements, current implementations, and feedback
- Tool developers
  - Engage in defining/refining the proposed architecture
  - Develop a classification of the types of functions decision tools may perform
  - Populate the catalog
- Academic and Research Community
  - Innovate to update or create new decision tools that can address unmet user needs
  - Engage in education and awareness

ESIP can facilitate a partnership between developers and users

Project Plan

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- Phase 1
  - Prototype by January 2013
  - Sponsorship from AWWI and ESIP
  - ESIP member universities - graduate student interns
- Phase 2
  - Operational system
  - Agency sponsorship
  - Pilots